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| 10/050,776 | 01/18/2002 | Akira Hamamatsu | 520.41064X00 | 9567 |

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| EXAMINER | |
|---|---|
| STAFIRA, MICHAEL PATRICK | |
| **ART UNIT** | **PAPER NUMBER** |
| 2877 | |

DATE MAILED: 01/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/050,776 | HAMAMATSU ET AL. | |
| | Examiner | Art Unit | |
| | Michael P. Stafira | 2877 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-23,26,27 and 29-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,2,4,5,8-14,17,20-23,26,27 and 29-31* is/are rejected.

7)☐ Claim(s) *3,6,7,15,16,18 and 19* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Claim Objections*

1. Claims 1, 26, 29 are objected to because of the following informalities: In the limitation "a comparison and judgment unit which classifies defects on the object to be inspected into scratches, thin film-like foreign materials **and** convex defects", should be changed to "foreign materials **or** convex defects" since applicants specification only discloses comparing and judging the measurement to determine if it's a scratch, thin film-like material or convex defect. Appropriate correction is required.

2. Claim13 is objected to because of the following informalities: In claim 13, the "second high-angle scattered light" should be the "second low-angle scattered light". Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

3. Claims 1, 2, 4, 5, 8-14, 17, 20-23, 26, 27, 29-31 are rejected under 35 U.S.C. 102(e) as being anticipated by Sekine et al. ('481).

**Claim 1**

Sekine et al. ('481) discloses a stage (See Fig. 1) on which an object (Fig.1, Ref. 2) to be inspected is mounted; an illumination optical system comprising; a high-angle illumination system (Fig. 12, Ref. 221) which illuminates light on surface of the object (Fig. 1, Ref. 2) to be inspected with desired luminous flux from a high-angle relative to the surface of the object (Col. 15, lines 11-29); and a low-angle illumination system (Fig. 12, Ref. 222) which illuminates light on the surface of the object to be inspected with desired luminous flux from a low-angle relative to said high-angle illumination system (Col. 15, lines 11-29); a detection optical system (See Fig. 12) comprising; an image formation optical system (Fig. 2, Ref. 200) which condenses light scattered from the surface of the object (Fig. 1, Ref. 2) by the illumination of the high-angle illumination system (Fig. 12, Ref. 221) and said low-angle illumination system (Fig. 12, Ref. 222); and a detector (Fig. 12, Ref. 227, 228) which detects light from the image formation optical system and converts the detected light into a first signal corresponding to said light illuminated by said high-angle illumination optical system and/or a second signal corresponding to said light illuminated by said low-angle illumination optical system (Col. 15, lines 21-50); and a comparison (Col. 15-16, lines 51-9) and judgment unit (Col. 16, lines 10-19) which classifies defects on the object to be inspected into scratches, thin-film-like foreign materials or convex-defects by using the first signal and/or the second signal, which have been converted by the photoelectric conversion unit of the detection optical system (Col. 15-16, lines 51-19).

**Claim 2**

Sekine et al. ('481) further discloses the incident illumination system of the illumination optical system is configured so that stray light is not generated from the high-angle image

information optical system (See Fig. 12, Ref. 225).

**Claim 4**

The reference of Sekine et al. ('481) further discloses that the comparison and judgment unit, the correlation between the first signal and the second signal is used to classify the defects into scratches, thin-like foreign materials or convex defects (Col. 15-16, lines 55-9).

**Claim 5**

Sekine et al. ('481) further discloses the comparison and judgment unit is configured to classify concave defects into scratches and thin film-like foreign materials on the basis of data in response to a defect size calculated by the first signal and the second signal (Col. 15-16, lines 55-9).

**Claim 8**

Sekine et al. ('481) further discloses the comparison and judgment unit has a displaying unit (Fig. 3, Ref. 130), which displays information of defects, be classified by the comparison and judgment unit (See Fig. 3).

**Claim 9**

The reference of Sekine et al. ('481) further discloses the comparison and judgment unit has a displaying unit (Fig. 3, Ref. 130) which displays information about a relation of the first signal to be classified the defects (Col. 8, lines 49-61).

**Claim 10**

Sekine et al. ('481) further discloses the comparison and judgment unit has a displaying unit (Fig. 3, Ref. 130) for displaying information about a relation of the second signal to discriminate a defect (Col. 8, lines 49-61).

**Claim 11**

The reference of Sekine et al. ('481) further discloses the comparison and judgment unit has a displaying unit (Fig. 3, Ref. 130) for plotting a relation between the first luminance signal and the second luminance signal, which have been converted by the photoelectric conversion means of the detection optical system, on a correlation diagram, where a horizontal axis and a vertical axis are expressed by logarithm values, to display the relation (See Fig. 10).

**Claim 12**

Sekine et al. ('481) discloses in the illumination optical system, a point incident-illuminated by the incident illumination system (Fig. 12, Ref. 225) and a point oblique-illuminated by the oblique illumination system (Fig. 12, Ref. 224), which are on the surface of the object to be inspected, are configured to be different from each other in a visual field of the detection optical system (See Fig. 12).

**Claim 13**

Sekine et al. ('481) discloses a stage (See Fig. 1) on which an object (Fig. 1, Ref. 2) to be inspected is mounted; high-angle illumination system (Fig. 12, Ref. 221) that illuminates with light including UV light (Col. 6, lines 50-52) at a point on a surface of the object to be inspected (See Fig. 1), which is mounted on the stage, with desired luminous flux from a high angle direction relative to the surface (See Fig. 12); and a low-angle illumination system (Fig. 12, Ref. 222) that illuminates light including UV light (Col. 6, lines 50-52), which has a wavelength different from that of said high-angle illumination light (See Fig. 12), at a point on the surface of the object (Fig. 1, Ref. 2) to be inspected with desired luminous flux; a condensing optical system (Fig. 2, Ref. 200) which condenses first scattered light (Fig. 12, Ref. 221), from among

first reflection light generated from the point, which has been illuminated by the high-angle illumination system (Fig. 12, Ref. 221) of the illumination optical system, and second scattered light, from among second reflection light generated from the point, which has been illuminated by the low-angle illumination system (Fig. 12, Ref. 222) of the illumination optical system; an image formation optical system (Fig. 2, Ref. 41) which performs image formation of each of the first high-angle scattered light and the second high-angle scattered light (See Fig. 12); and a first and a second photoelectric conversion unit (Fig. 12, Ref. 227, 228) which receives each of the first high-angle scattered light (Fig. 12, Ref, 221) and the second low-angle scattered light (Fig. 12, Ref. 222), for which image formation has been performed by the image formation optical system, to convert the first high-angle scattered light and the second low-angle scattered light into a first signal and a second signal respectively (Col. 15, lines 20-29); and a comparison (Col. 15-16, lines 55-9) and judgment unit (Col. 16, lines 10-25) which discriminates a defect on the object to be inspected on the basis of a relation between the first signal converted by the first photoelectric conversion means and the second signal converted by the second photoelectric conversion means in the detection optical system (Col. 15-16, lines 55-25).

**Claim 14**

Sekine et al. ('481) further discloses the incident illumination system of the illumination optical system is configured so that stray light is not generated from the high-angle image condensing optical system (See Fig. 12, Ref. 225).

**Claim 17**

Sekine et al. ('481)further discloses the comparison and judgment unit is configured to classify concave defects into scratches and thin film-like foreign materials on the basis of data in

response to a defect size calculated by the first signal and the second signal (Col. 15-16, lines 55-9).

**Claim 20**

Sekine et al. ('481) further discloses the comparison and judgment unit has a displaying unit (Fig. 3, Ref. 130) has an displaying means for displaying information of a discriminated defect (Col. 8, lines 49-61).

**Claim 21**

Sekine et al. ('481) further discloses the comparison and judgment unit has a displaying unit (Fig. 3, Ref. 130) for displaying information about a relation of the first signal to discriminate a defect (Col. 8, lines 49-61).

**Claim 22**

Sekine et al. ('481) further discloses the comparison and judgment unit has a displaying unit (Fig. 3, Ref. 130) for displaying information about a relation of the second signal to discriminate a defect (Col. 8, lines 49-61).

**Claim 23**

The reference of Sekine et al. ('481) further discloses the comparison and judgment unit has a displaying unit (Fig. 3, Ref. 130) for plotting a relation between the first luminance signal and the second luminance signal, which have been converted by the photoelectric conversion means of the detection optical system, on a correlation diagram, where a horizontal axis and a vertical axis are expressed by logarithm values, to display the relation (See Fig. 10).

**Claim 26**

Sekine et al. ('481) discloses a high-angle illumination light (Fig. 12, Ref. 221) onto a surface of an object (Fig. 1, Ref, 2) to be inspected with desired luminous flux from a high-angle relative to the surface of the object (Fig. 1, Ref. 2), and low-angle illumination light (Fig. 12, Ref. 222) onto the surface of the object (Fig. 1, Ref. 2) to be inspected with desired luminous flux from a low-angle relative to said high-angle illumination (Col. 15, lines 11-50); condensing light (Fig. 2, Ref. 200) scattered from the surface of the object (Fig. 1, Ref. 2) by the illumination of the high-angle illumination (Fig. 12, Ref. 221) and the low-angle illumination (Fig. 1, Ref. 222); and receiving the detected light from the condensing, and converting the detected light into a first signal corresponding to said light illuminated by said high-angle illumination (Fig. 12, Ref. 228) and/or a second signal corresponding to said light illuminated by said low-angle illuminating (Fig. 12, Ref. 227); and comparing (Col. 15-16, lines 51-9) and judging (Col. 16, lines 10-25) to classify defects on the object to be inspected into scratches, thin film-like foreign materials or convex defects by using the first signal and the second signal, which have been converted by the converting operation (Col. 15-16, lines 20-20).

**Claim 27**

Sekine et al. ('481) discloses high-angle illuminating illumination light including UV light (Col. 6, lines 50-52) at a point on a surface of an object (Fig. 1, Ref. 2) to be inspected, which is mounted on a stage (See Fig.1), with desired luminous flux from a high-angle direction (Fig. 12, Ref. 221) relative to the surface using an high-angle illuminating system; and low-angle illuminating illumination light (Fig. 12, Ref. 222) including UV light, which has a wavelength different from that of said high-angle illumination light (Fig. 12, Ref. 221), at a point on the surface of the object to be inspected with desired luminous flux using a low-angle illuminating

system; condensing first scattered light (Fig. 2, Ref. 200), from among first reflection light generated from the point, which has been illuminated by the high-angle illumination step, and second scattered light, from among second reflection light generated from the point, which has been illuminated by the low-angle illuminating step, using a condensing optical system (See Fig. 12); performing image formation (Fig. 2, Ref. 41) for each of the first high-angle scattered light and the second high-angle scattered light (See Fig. 2); receiving each of the first high-angle scattered light (Fig. 12, Ref. 221) and the second high-scattered light (Fig. 12, Ref. 222) and the second high-angle scattered light into a first signal (Fig. 12, Ref. 228) and a second signal (Fig. 12, Ref. 227) respectively; and a comparison (Col. 15-16, lines 51-9) and judgment (Col. 16, lines 10-19) step for discriminating a defect on the object to be inspected on a basis of a correlation between the first signal converted by the detection step and the second signal converted by the second photoelectric conversion means (Col. 15-16, lines 51-19).

**Claim 29**

Sekine et al. ('481) discloses high-angle illumination light (Fig. 12, Ref. 221) onto a surface of an object to be inspected with desired luminous flux from a high-angle relative to the surface of the object (Fig. 1, Ref. 2); and low-angle illumination light (Fig. 12, Ref. 2222) onto the surface of the object (Fig. 1, Ref. 2) to be inspected with desired luminous flux from a low-angle relative to said high-angle illumination (Fig. 12, Ref. 221); condensing light (Fig. 2, Ref. 200) scattered from the surface of the object (Fig. 1, Ref. 2) by the illumination of the high-angle illumination (Fig. 12, Ref. 221) and the low-angle illumination (Fig. 12, Ref. 222): and receiving the detected light from the condensing, and converting the detected light into a first signal (Fig. 12, Ref. 228) corresponding to said light illuminated by said high-angle illumination and a

second signal (Fig. 12, Ref. 227) corresponding to said light illuminated by said low-angle illumination; comparing (Col. 15-16, lines 51-9) and judging (Col. 16, lines 10-19) to classify defects on the object to be inspected into scratches, thin film-like foreign materials or convex defects by using the first signal and the second signal, which have been converted by the converting operation; and supplying the fabrication process with information of the scratches, thin film-like foreign materials and convex defects, which have been judged in the defect inspection process, as feedback (Col. 15-16, lines 51-19).

**Claim 30, 31**

Sekine et al. ('481) discloses wavelength-separating (Fig. 2, Ref. 41) the first high-angle scattered light and the second high-angle scattered light, which have been condensed (Fig. 2, Ref. 200).

### *Allowable Subject Matter*

4. Claims 3, 6, 7, 15, 16, 18, 19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael P. Stafira whose telephone number is 571-272-2430. The examiner can normally be reached on 4/10 Schedule Mon.-Thurs..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Toatley can be reached on 571-272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michael P. Stafira
Primary Examiner
Art Unit 2877

January 12, 2006